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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/655,304	09/05/2000	Tsutomu Hiroki	196743US2	8484

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/30/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/655,304

Applicant(s)

HIROKI, TSUTOMU

Examiner

Karla Moore

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 21-24 is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 09-216182 A to Toba et al. in view of U.S. Patent No. 5,993,141 to Wytman.

4. Toba et al. disclose the invention substantially as claimed and comprising: a transfer apparatus for a semiconductor process, comprising: an articulated arm unit (13) attached to a support base (10) to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm (12) which reciprocates in a first direction when the articulated arm unit stretches and retracts; a support member (14) arranged on the distal end arm to support a target substrate, the support member being attached the distal end arm to be reciprocatable in the first direction; a main driving mechanism (15) configured to stretch/retract the articulated arm unit; and a sub-driving mechanism (21) configured to reciprocate the support member relative to the distal end arm.

5. However, Toba et al. fail to teach the support member being attached to the distal end arm to be linearly reciprocatable relative to the distal end arm in the first direction.

6. Wytman teach the use of linearly reciprocatable support members (Figure 1, 13a/14a and 13b/14b) on a transfer mechanism (10) for the purpose of carrying a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed (column 5, rows 53-59).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided linearly reciprocatable support members in Toba et al. in order to carry a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed as taught by Wytman et al.

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8. With respect to claim 7, Toba et al. further teach the use of a pair of separate motor drives so that an approach shifting of the support member is done independently of a rotation shifting of the arms. The signals for controlling the position of the articulated arm unit are controlled via controller (40; abstract and advantage).

9. Claims 1-4, 10-11, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,306,380 to Hiroki in view of U.S. Patent No. 5,993,141 to Wytman.

10. Hiroki discloses the invention substantially as claimed and comprising: a transfer apparatus for a semiconductor process in Figures 2, 4 and 5, comprising: an articulated arm unit (7) attached to a support base (9) to be stretchable /retractable within a horizontal plane, the articulated arm unit having a distal end arm (7b) which reciprocates in a first direction when the articulated arm unit stretches and retracts; a support member (7c) arranged on the distal end arm to support a target substrate (S), the support member being attached to the distal end arm to be reciprocatable in the first direction; a main driving mechanism (multiple part numbers-54, 58, 62, 64; column 4, 55-65) configured to stretch/retract the articulated arm unit; and a sub-driving mechanism (multiple part numbers-86, 92, 94, 96, 98, 102; column 5, rows 8-32) configured to reciprocate the support member relative to the distal end arm.

11. However, Hiroki et al. fails to teach the support member being attached to the distal end arm to be linearly reciprocatable relative to the distal end arm in the first direction.

12. Wytman teach the use of linearly reciprocatable support members (Figure 1, 13a/14a and 13b/14b) on a transfer mechanism (10) for the purpose of carrying a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed (column 5, rows 53-59).

13. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided linearly reciprocatable support members in Hiroki in order to carry a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed as taught by Wytman et al.

14. With respect to claim 2, the support member reciprocates relative to the distal end arm, while the articulated arm stretches/retracts (see Figures 6A-6E).

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15. With respect to claim 3, the sub-driving mechanism is mechanically connected to the main driving mechanism, such that reciprocation of the support member is performed in accordance with stretching/retracting of the articulated arm unit (see Figures 5 and Figures 6A-6E).

16. With respect to claim 4, the sub-driving mechanism includes a pair of pulleys (86 and 94) axially supported by the distal end arm, and a timing belt (92) extending between the pulleys, the belt being connected (by shaft, 96) to the support member.

17. With respect to claims 10 and 17, the apparatus further comprises a pair of temporary shelves (Figure 1 and 2, 8) configured to support the target substrate, and disposed to sandwich the support member when the articulated arm member and the support member retract, and a vertical driving mechanism (56) configured to vertically drive the support member and the temporary shelves relative to each other in order to transfer the target substrate there between.

18. With respect to claim 11, the articulated arm unit is rotatable within a horizontal plane relative to the support base, and the transfer apparatus further comprises a rotational driving mechanism (multiple part numbers-54, 58, 62, 64, 66; column 4, row 60 through column 5, row 7) configured to rotate the articulated arm mechanism.

19. With respect to claim 16, the semiconductor processing system may further comprise: an airtight process chamber (3a and 3c, column 3, rows 34-36); a worktable (11) with a mount surface to support a target substrate disposed in the process chamber; a supply system configured to supply a process gas into the process chamber (column 3, rows 26-29; though the supply system is not explicitly mentioned in the disclosure, it would be inherently present in an apparatus); an exhaust system (column 3, rows 34-36) configured to evacuate an interior of the process chamber by vacuum; and an airtight transfer chamber (1, column 3, rows 30-32) connected to the process chamber through a gate (4) housing the transfer apparatus described above.

20. Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,135,608 to Okutani in view of Japanese Patent Publication No. 09-216182 A to Toba et al. and in view of U.S. Patent No. 5,993,141 to Wytman.

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21. Okutani discloses the invention substantially as claimed and comprising: a semiconductor processing system comprising: an airtight process chamber (Figures 1, 9 and 10; Figure 32; column 5, rows 3-4); a worktable (548) with a mount surface to support a target substrate disposed in the process chamber; a supply system (578) configured to supply a process gas into the process chamber; an exhaust system (585) configured to evacuate an interior of the chamber by vacuum; an airtight transfer chamber (Figure 1. 6) connected to the process chamber through a gate (12 and 13); and a transfer apparatus (7) disposed in the transfer chamber to load/unload the target substrate into/from the process chamber.

22. However, Okutani fails to disclose the articulated arm unit as claimed.

23. Toba et al. disclose the articulated arm unit as claimed and as described above including a controller for driving the sub-driving mechanism independently of the main driving mechanism for the purpose of conveying substrates with improved rotor endurance, prevention of twisting of cables during arm and hand movement and improved reliability (abstract/advantage).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transfer unit as taught in Toba et al. in Okutani in order to convey substrates with improved rotor endurance, prevention of twisting of cables during arm and hand movement and improved reliability.

25. Okutani and Toba et al. disclose the invention substantially as claimed and as described above.

26. However, Okutani and Toba et al. fail to teach the support member being attached to the distal end arm to be linearly reciprocable relative to the distal end arm in the first direction.

27. Wytman teaches the use of linearly reciprocable support members (Figure 1, 13a/14a and 13b/14b) on a transfer mechanism (10) for the purpose of carrying a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed (column 5, rows 53-59).

28. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided linearly reciprocable support members in Okutani and Toba et al. in order to carry a wafer for placement into a chamber for processing or for retrieving a wafer that has already been processed as taught by Wytman et al.

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Allowable Subject Matter

29. Claims 5-6, 8-9 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

30. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 5-6 and 8-9, the prior art fails to teach or fairly suggest a transfer apparatus for a semiconductor process as recited, wherein the sub-driving mechanism includes a pair of sprockets axially supported by the distal end arm, and a chain extending between the pair of sprockets, the chain being connected to the support member or wherein the sub-driving mechanism is connected to the main driving mechanism through a speed increasing device. With respect to claim 18, the prior art fails to teach a set of first lifters and a set of second lifters disposed to surround the worktable. With respect to claim 19, the prior art fails to teach the support member capable of reciprocating relative to the distal end arm while the articulated arm unit stretches and retracts.

31. Claims 12 and 21-24 are allowed.

32. The following is an examiner's statement of reasons for allowance: With respect to claim 12, the prior art fails to teach a pair of temporary shelves configured to support the target substrate, and disposed to sandwich the support member when the articulated arm unit retracts, the temporary shelves being arranged not to rotate together with the articulated arm unit. With respect to claims 21-24, similar to claims 5-6 and 8-9, the prior art fails to teach or fairly suggest a transfer apparatus for a semiconductor process as recited in independent claim 1 and dependent claim 3, wherein the sub-driving mechanism includes a pair of sprockets axially supported by the distal end arm, and a chain extending between the pair of sprockets, the chain being connected to the support member or wherein the sub-driving mechanism is connected to the main driving mechanism through a speed increasing device.

33. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Response to Arguments

34. Applicant's arguments with respect to claims 1-4, 7, 10-11 and 16-17 have been considered but are moot in view of the new ground(s) of rejection. New art has been incorporated which teaches a linearly reciprocable support member as amended. Rejections based on Hiroki '095 reference have been withdrawn.

Conclusion

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
July 28, 2003

*primary Examiner
AU 1763
P. Vaslenko*